

## Application for Federal Assistance SF-424

**\* 1. Type of Submission:**

- ☐ Preapplication  
☒ Application  
☐ Changed/Corrected Application

**\* 2. Type of Application:**

- ☒ New  
☐ Continuation  
☐ Revision

**\* If Revision, select appropriate letter(s):**

**\* Other (Specify):**

**\* 3. Date Received:**

03/18/2019

**4. Applicant Identifier:**

**5a. Federal Entity Identifier:**

84-6000563

**5b. Federal Award Identifier:**

**State Use Only:**

**6. Date Received by State:**

**7. State Application Identifier:**

**8. APPLICANT INFORMATION:**

**\* a. Legal Name:**

City of Aspen

**\* b. Employer/Taxpayer Identification Number (EIN/TIN):**

84-6000563

**\* c. Organizational DUNS:**

0764601040000

**d. Address:**

**\* Street1:**

130 South Galena Street

**Street2:**

**\* City:**

Aspen

**County/Parish:**

**\* State:**

CO: Colorado

**Province:**

**\* Country:**

USA: UNITED STATES

**\* Zip / Postal Code:**

81611-1000

**e. Organizational Unit:**

**Department Name:**

Water Department

**Division Name:**

**f. Name and contact information of person to be contacted on matters involving this application:**

**Prefix:**

Ms.

**\* First Name:**

Lee

**Middle Name:**

**\* Last Name:**

Ledesma

**Suffix:**

**Title:**

Utilities Finance and Administrative Manager

**Organizational Affiliation:**

Full Time Employee

**\* Telephone Number:**

970-429-1975

**Fax Number:**

970-920-5117

**\* Email:**

lee.ledesma@cityofaspen.com

## Application for Federal Assistance SF-424

### \* 9. Type of Applicant 1: Select Applicant Type:

C: City or Township Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\* Other (specify):

### \* 10. Name of Federal Agency:

Department of Interior/U.S. Bureau of Reclamation

### 11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

### \* 12. Funding Opportunity Number:

BOR-DO-19-F004

\* Title:

WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2019

### 13. Competition Identification Number:

Title:

### 14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment

Delete Attachment

View Attachment

### \* 15. Descriptive Title of Applicant's Project:

City of Aspen - Meter Replacement in Support of Enhanced Water Loss Control

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

**Application for Federal Assistance SF-424****16. Congressional Districts Of:**\* a. Applicant \* b. Program/Project 

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

**17. Proposed Project:**\* a. Start Date: \* b. End Date: **18. Estimated Funding (\$):**

* a. Federal	<input type="text" value="271,000.00"/>
* b. Applicant	<input type="text" value="271,159.68"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="542,159.68"/>

**\* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

- ☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .
- ☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- ☒ c. Program is not covered by E.O. 12372.

**\* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment

Delete Attachment

View Attachment

**21. \*By signing this application, I certify (1) to the statements contained in the list of certifications\*\* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances\*\* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ \*\* I AGREE

\*\* The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**Authorized Representative:**

Prefix:  \* First Name:

Middle Name:

\* Last Name:

Suffix:

\* Title: \* Telephone Number:  Fax Number: \* Email: \* Signature of Authorized Representative:  \* Date Signed:

### BUDGET INFORMATION - Construction Programs

*NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.*

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$ 3,034.68	\$	\$ 3,034.68
2. Land, structures, rights-of-way, appraisals, etc.	\$ 0.00	\$	\$ 0.00
3. Relocation expenses and payments	\$ 0.00	\$	\$ 0.00
4. Architectural and engineering fees	\$	\$	\$
5. Other architectural and engineering fees	\$	\$	\$
6. Project inspection fees	\$	\$	\$
7. Site work	\$	\$	\$
8. Demolition and removal	\$	\$	\$
9. Construction	\$ 416,900.00	\$	\$ 416,900.00
10. Equipment	\$ 104,225.00	\$	\$ 104,225.00
11. Miscellaneous	\$ 18,000.00	\$	\$ 18,000.00
12. SUBTOTAL (sum of lines 1-11)	\$ 542,159.68	\$	\$ 542,159.68
13. Contingencies	\$	\$	\$
14. SUBTOTAL	\$ 542,159.68	\$	\$ 542,159.68
15. Project (program) income	\$	\$	\$
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 542,159.68	\$	\$ 542,159.68
<b>FEDERAL FUNDING</b>			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter eligible costs from line 16c Multiply X 49.99 % Enter the resulting Federal share.			\$ 271,000.00

## ASSURANCES - CONSTRUCTION PROGRAMS

OMB Number: 4040-0009  
Expiration Date: 01/31/2019

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant:, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

<b>SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL</b>	<b>TITLE</b>
Lee Ledesma	Utilities Finance and Administrative Manager
<b>APPLICANT ORGANIZATION</b>	<b>DATE SUBMITTED</b>
City of Aspen	03/14/2019

# City of Aspen

## Meter Replacement in Support of Enhanced Water Loss Control

WaterSMART: Water and Energy Efficiency Grants for FY 2019

Funding Opportunity BOR-DO-19-F004

Prepared By:

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970.429.1975

March 15, 2019



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## 1. EXECUTIVE SUMMARY

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### 1.1 APPLICATION INFORMATION

<b>Submittal Date</b>	March 19, 2019
<b>Applicant</b>	City of Aspen, Colorado Lee Ledesma, Utilities Finance and Administrative Services Manager Water Department 130 Galena Street Aspen, CO 81611 970-429-1975
<b>Funding Group</b>	I
<b>Grant Funding Requested</b>	\$271,000
<b>Total Project Budget</b>	\$542,159.68
<b>Project Duration</b>	August 2019 through December 2020 (17 months)
<b>Estimated Project Completion Date</b>	December 31, 2020
<b>Project Location</b>	Existing residential and commercial locations throughout the City of Aspen's service area located in Aspen, Colorado. Project location is not located on a Federal facility.

### 1.2 PROJECT SUMMARY

The City of Aspen, Colorado ("Aspen" or "the City") is a home-rule municipality that owns and operates its water utilities, providing treated (potable) water to all customers in the service area and raw water for hydroelectric production as well as for irrigation and snowmaking purposes to a small subset of customers. The City is an active leader in water conservation and efficiency in the State of Colorado and is committed to sustainable water use practices and programs both locally and regionally. Aspen Water Utility provides service to approximately 4,000 accounts located inside and outside the Aspen Municipal boundary. Out of those accounts, there are 3,400 residential accounts and 600 commercial accounts. Within the infrastructure of the Aspen Water Utility, the property owner owns, and is responsible for, their water service line, curb box valve and water meter. Approximately 10% of the existing water meters are out of compliance with current City Distribution Standards and are incompatible with system upgrades associated with the City's transition to an AMI system, requiring the replacement of approximately 379 existing water meters. The proposed Meter Replacement in Support of Enhanced Water Loss Control project will include meter equipment purchase and installation costs for the identified non-compliant meters. An outreach and communications plan will be developed and implemented to support this meter replacement. Water savings realized through this project will be quantified and reported.

## 2. BACKGROUND

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### 2.1 WATER SUPPLIES

Aspen owns and operates its own water utilities. It provides treated (i.e. potable) water to all customers in the service area and raw water for irrigation and snowmaking purposes to a small subset of customers. Aspen obtains its water supply primarily from the surface water sources of Maroon Creek and Castle Creek, which are tributary to the Roaring Fork River, which is tributary to the Colorado River. The City also has some ability to use three groundwater wells as a supplemental supply.

Aspen has adopted a policy to maintain streamflows in the creeks downstream of its diversion structures at flow rates at or above the Colorado Water Conservation Board's ("CWCB") decreed instream flow rights for the protection of the fishery and the associated aquatic habitats in those streams. Aspen has a long history of commitment to protecting instream flows. In 1980, Aspen entered into an agreement with the CWCB to allow the City's very senior 15 cfs Hunter Creek Flume and Pipeline water right to be used for instream flows on Hunter Creek, and the water court approved that use. In 1993, the City Council adopted water management policies intended to provide for current and future municipal water needs while at the same time maintaining decreed minimum streamflows and aquatic habitat. Aspen has an intergovernmental agreement with the CWCB to protect the natural environment of Castle Creek by operating the City's water rights on Castle Creek in a manner that will allow the decreed minimum streamflow of 12 cubic feet per second to be maintained under all but the most severe low flow conditions, or emergencies. Although Aspen does not have a similar agreement regarding Maroon Creek, Aspen also operates its Maroon Creek water rights in a way that protects the decreed instream flows. More recently, Aspen negotiated temporary "Forbearance Agreements" with the Colorado Water Trust in 2013 and 2014, under which Aspen agrees to not divert a portion of its senior Wheeler Ditch water right during the irrigation season when the CWCB's decreed instream flow in the Aspen reach of the Roaring Fork River is not being satisfied.

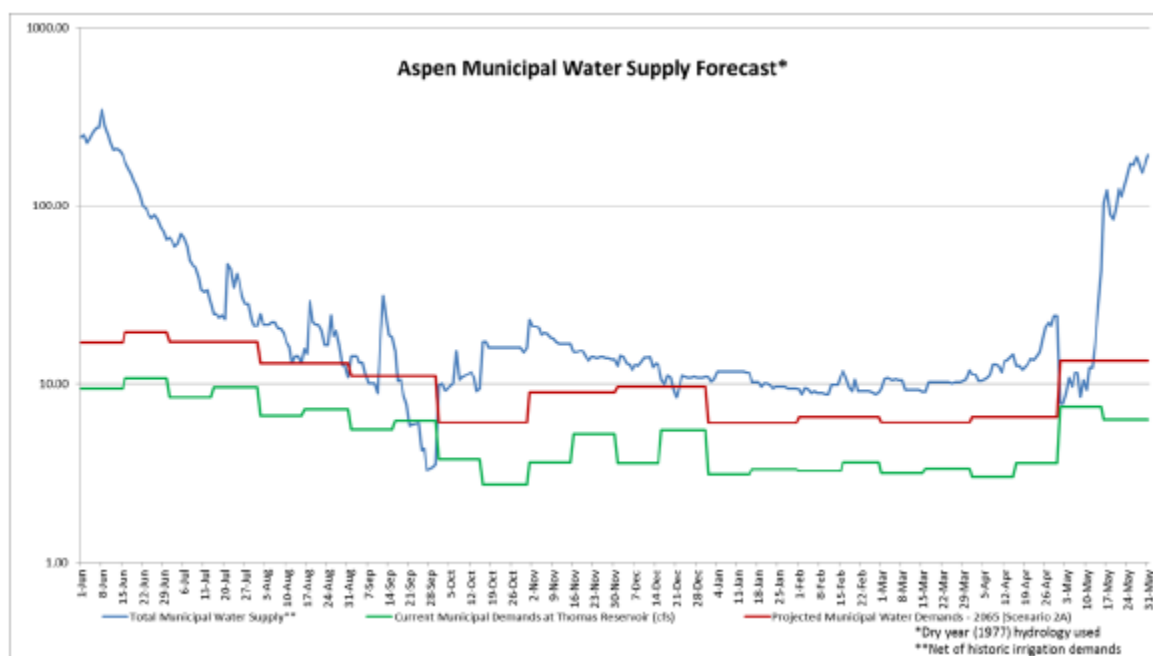


The City updated its municipal Water Efficiency Plan ("WEP") in 2015, which included an analysis of then-current demands and supplies and a projection of future demands. For water supply planning purposes, the City of Aspen uses the critically dry year of 1977 which is on par with the more recent critically dry years of 2002 and 2012 and is a good representation of the firm yield of the City's water rights from both Maroon and Castle Creeks under current climate conditions. The annual firm (1977) water supply available for treated and raw water irrigation diversions from Castle Creek and Maroon Creek is estimated to be around 26,850 AF/yr at current infrastructure capacities. However, the City does not have a storage component that would allow it to retime water supplies to match water deliveries with demands. Rather, the City is dependent upon streamflow availability, which is susceptible to annual variability and changing

conditions, as well as daily variability. For Aspen, the water supply is most vulnerable in the late summer, after the snowmelt runoff period has ended, and when landscape irrigation demands are still high. Under historical hydrology patterns, and considering Aspen's goal of protecting decreed instream flows as described above in addition to continued raw water diversion for irrigation, the daily firm yield of the treated water system is estimated to be around 7.8 MGD.

A change in the volume or timing of streamflow and/or demand growth beyond the levels currently projected (the WEP considers growth in demand through 2035 while the City's water planning extends to 2065) would result in the City having a water supply issue in dry years. For example, Figure 1 below shows a potential municipal demand scenario in the year 2065<sup>1</sup>, based on the City's water planning and forecasting that is conducted independent of the WEP. As depicted, this scenario would result in a significant water supply shortage during the late summer if the water supply was similar to a historical critically dry year such as 1977<sup>2</sup>. This emphasizes the importance of demand management, particularly for landscaping purposes.

**Figure 1: Aspen Municipal Water Supply Forecast**



The City of Aspen's water distribution system consists of 16 separate pressure zones. The pressure zones are supplied by 14 water storage tanks that are fed by 14 pumping stations and the three wells. The water distribution system is comprised of approximately 73.2 miles of water mainlines that range in size from

<sup>1</sup> The 2065 projected municipal water demand shown in Figure 1 does not include use of reclaimed water. This figure was developed for the WEP.

<sup>2</sup> This projection does not include storage in the Castle Creek Reservoir or Maroon Creek Reservoir, for which Aspen holds conditional storage rights. Aspen is developing strategies for incorporating water storage into its integrated water supply, and the conditional decrees remain an important component of Aspen's portfolio of water rights.

24 inches (") to 4" in diameter. For Aspen, more efficient use of water and water loss management also results in a direct energy usage reduction.

## 2.2 WATER DEMANDS

The City of Aspen provides both treated and raw water service to a total of approximately 4,000 customer connections within the City and in adjoining areas through service contracts. The City's year-round, full-time service area population was approximately 10,506 residents as of 2014. Aspen typically experiences seasonal population changes, associated with non-permanent residents and visitors. The weeks before/of Fourth of July and Christmas typically result in the highest water demands. With events like X Games, the City's population can increase up to a total of 100,000 consumers. Most demands described in this section were developed in support of the WEP, representing data available for 2009 through 2013.

Total treated water demand for Aspen's system (including snowmaking, West Buttermilk bulk deliveries, etc.) was 3,220 AF in 2012 and 2,955 AF in 2013 as shown in Table 1 below. Annual metered treated water use in the City of Aspen, the focus of the demand analysis for the WEP, ranged from 2,568 AF to 2,752 AF over the 5 years (Table 1). Metered treated use was within 4% of the average in each of the 5 years, which suggests that the system demands fluctuate very little on an annual basis. Increases in population over the five years did not cause a resultant increase in water demands (Table 1). These changes are typical of municipal demand trends across the United States, which have generally declined or held steady in recent years even as population has increased. The City's current water rate structure, water efficiency program, national plumbing codes and standards, and programs like EPA WaterSense contribute to this decrease in per capita water use.

Baseline treated water demands of 3,186 AF/yr, (2,661 AF/yr for City customers and 525 AF/yr for snowmaking, West Buttermilk, etc.) were selected for use in forecasting future demand in Aspen as shown in Table 1.

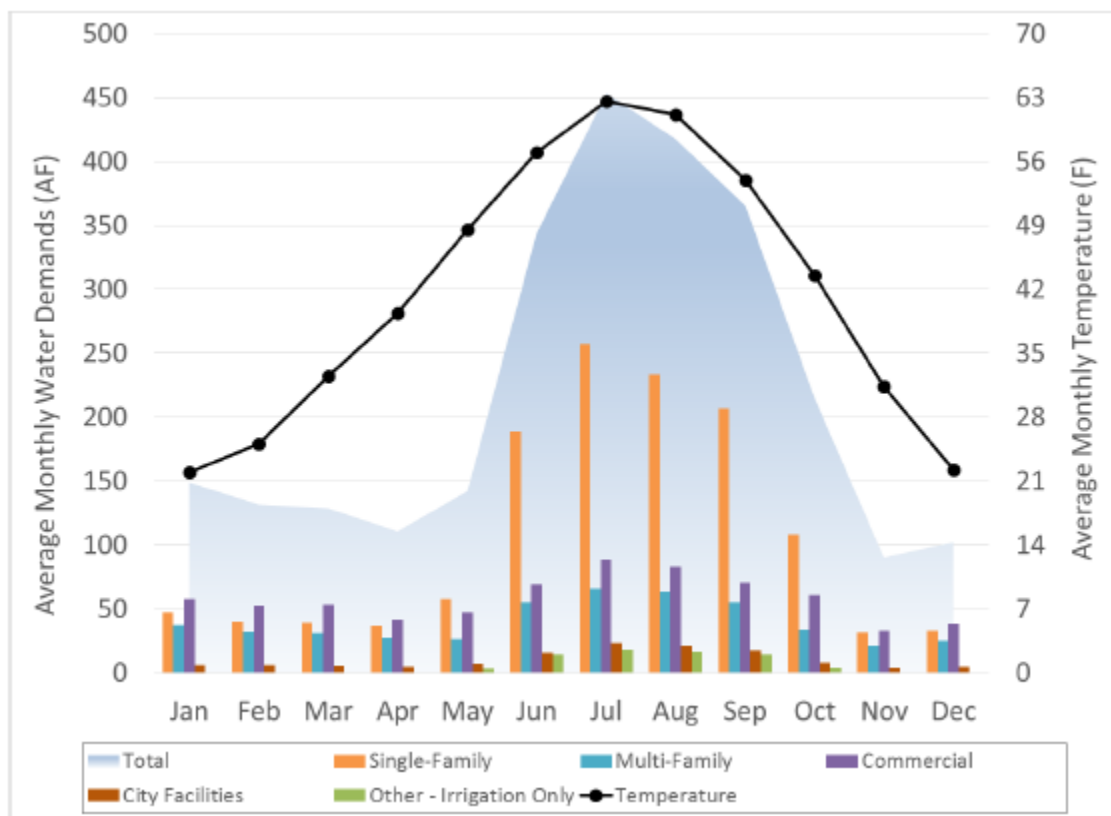
**Table 1: Annual Treated Water Deliveries from 2009 through 2013 and Baseline for Forecasting (AF/yr unless noted otherwise)**

Year	City of Aspen Water Customers							Additional Water Sales				Total
	Full-Time Population (#)	Single-Family Res.	Multi-Family Res.	Comm.	City Facilities	Other - Irrig. Only	Total	Unmetered Sales (Est.)	Snow Making (Aspen Ski Co.)	West Buttermilk	Bulk Water Sales	
2009	9,897	1,210	446	760	132	68	2,616	295	126	-	6	-
2010	10,016	1,289	497	785	115	66	2,752	273	142	-	6	-
2011	10,136	1,245	458	668	125	72	2,568	218	146	45	6	2,983
2012	10,258	1,390	485	647	129	85	2,736	246	151	81	6	3,220
2013	10,381	1,265	483	626	124	75	2,573	110	192	73	6	2,955
BASELINE	10,318	1,280	484	697	125	75	2,661	246	192	81	6	3,186

As with most municipalities in Colorado, the City of Aspen's demands are higher during summer months due to outdoor water use. Figure 2 shows the average monthly metered treated water demands represented in the WEP from 2009 to 2013 by water use sector versus the mean monthly temperature. As a result of outdoor water use, all water use sector demands increase during summer months from June through October. The residential pattern correlates particularly well with temperature during summer months, and the peak usage in July is 6.4 times the average winter consumption ("AWC"). Multi-family

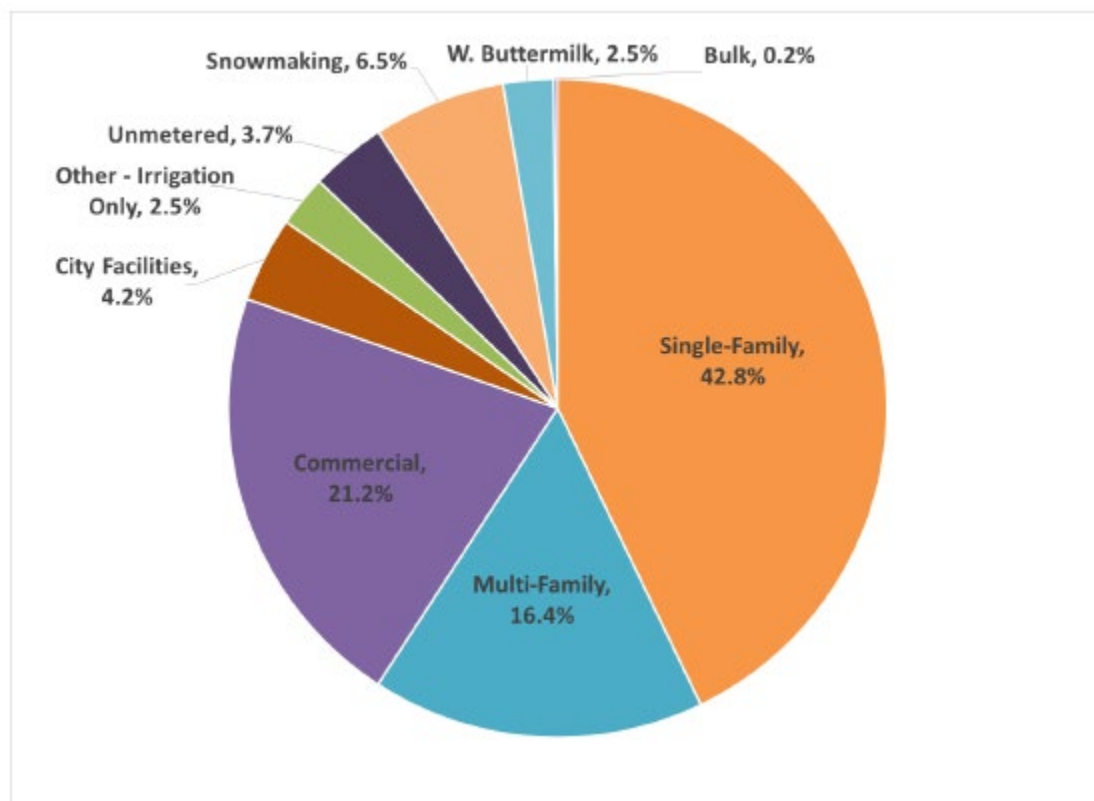
residential and commercial water usage increases during summer months to a lesser degree, as evidenced by the peak monthly usage being 2.1 and 1.8 times the AWC, respectively. The peak city facilities usage exceeds the AWC by a factor of 4.0 in July, which suggests there is a fair amount of outdoor irrigation or other seasonal water uses. The distribution of distribution of annual demands by sector is shown in Figure 3.

**Figure 2: City of Aspen, Average Monthly Metered Treated Demands by Sector from 2009 through 2013**





**Figure 3: Distribution of Annual Water Use by Sector in 2013**



### **2.3 WATER CONSERVATION AND EFFICIENCY**

The Roaring Fork Watershed Plan (“Watershed Plan”), published in May of 2012 and sponsored by the Ruedi Water & Power Authority, brought together groups throughout the Roaring Fork Watershed in an effort to “plan for and work toward an environmentally and economically healthy watershed that benefits all who have a stake in it”. Through this collaborative effort, the Watershed Plan identified the benefits from municipal water conservation and a need for a Regional Water Efficiency Plan. The Roaring Fork watershed significantly contributes flows to the Colorado River.

Shortly after the publication of the Watershed Plan, Aspen began efforts to develop its WEP and actively participated in developing the Regional Water Efficiency Plan for the Roaring Fork Watershed (“RF Regional WEP”). These efforts progressed in parallel and both were published in 2015. One program specifically identified in both WEPs, focused on outdoor water use efficiency, is generally referred to as ‘efficient landscape regulations’. Prior to applying for the Project Grant, Aspen’s implementation of this program included the development of Aspen’s existing Water Efficient Landscaping Ordinance (“Landscaping Ordinance”) to initiate a Pilot Program and development of Water Efficient Landscaping Standards (“Landscaping Standards”) that provide details of the requirements under the Pilot Program. The Landscaping Standards focus on landscaping water budgets, efficient irrigation system design and installation, and field audits. The Landscaping Standards promote water conservation, prevent water waste, and protect water quality. Through this focused, multi-year program, the Watershed Plan, RF Regional WEP, and Aspen WEP have built upon each other to target outdoor water use reductions.



Aspen's water supply system is unique in that Aspen does not currently have a large storage reservoir like most local water systems. Aspen's supplies are direct-flow water rights and seasonal fluctuations and environmental conditions directly impact the availability of those supplies. This coupled with Aspen's social and environmental commitment to sustainability, and their location near the headwaters of the Roaring Fork Watershed, drive Aspen to actively promote projects and programs that support the efficient and sustainable use of water.



Aspen's WEP identified an Enhanced Water Loss Control Program as a key foundational water efficiency program. This includes recommendations for ongoing water loss audits and subsequent projects and programs to reduce the identified losses. The meter replacement project described in this grant application directly supports this foundational program. It is also an integral tool in Aspen's comprehensive water efficiency program, providing improved and more real time water use data which enables more advanced rate structures and direct customer communication in terms of managing leaks and providing water usage and incentives.

## **2.4 PRIOR RELATIONSHIPS WITH THE BUREAU OF RECLAMATION**

In March of 2015, the City of Aspen successfully secured a FEMA Hazard Mitigation Grant for standby generators at three City facilities in the amount of \$54,736. The total project cost was initially estimated at \$90,214, with the City's share totaling \$24,201 and an additional \$11,277 awarded through the State of Colorado Division of Homeland Security and Emergency Management from PDMP (Pre-Disaster Mitigation Plan) / HMGP (Hazard Mitigation Grant Program). Ultimately, the City's contribution exceeded the initial estimate, but all associated grant funding remained unchanged. The backup electric generators were installed at three critical city facilities and all three were classified in a critical need class.

### 3. PROJECT LOCATION

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The City of Aspen, Colorado is located at 39.1911 degrees N, 106.8175 degrees W in Pitkin County. Aspen is situated in the upper reaches of the Roaring Fork Valley near the confluences of the main-stem of the Roaring Fork River with Hunter Creek, Castle Creek, and Maroon Creek at an elevation of approximately 7,900 feet. The Roaring Fork River is a tributary to the Upper Colorado River, as shown in Figure 4<sup>3</sup> below.

Aspen is located along Colorado State Highway 82 approximately 20 miles west of Independence Pass. The incorporated area (within the municipal boundary) consists of approximately 3.83 square miles. However, at this time, the total service territory is approximately 8.5 square miles, and includes unincorporated areas served by Aspen. The proposed project is located entirely within the City's service area, as shown in Figure 5 below.

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<sup>3</sup> U.S. Department of the Interior – Bureau of Reclamation

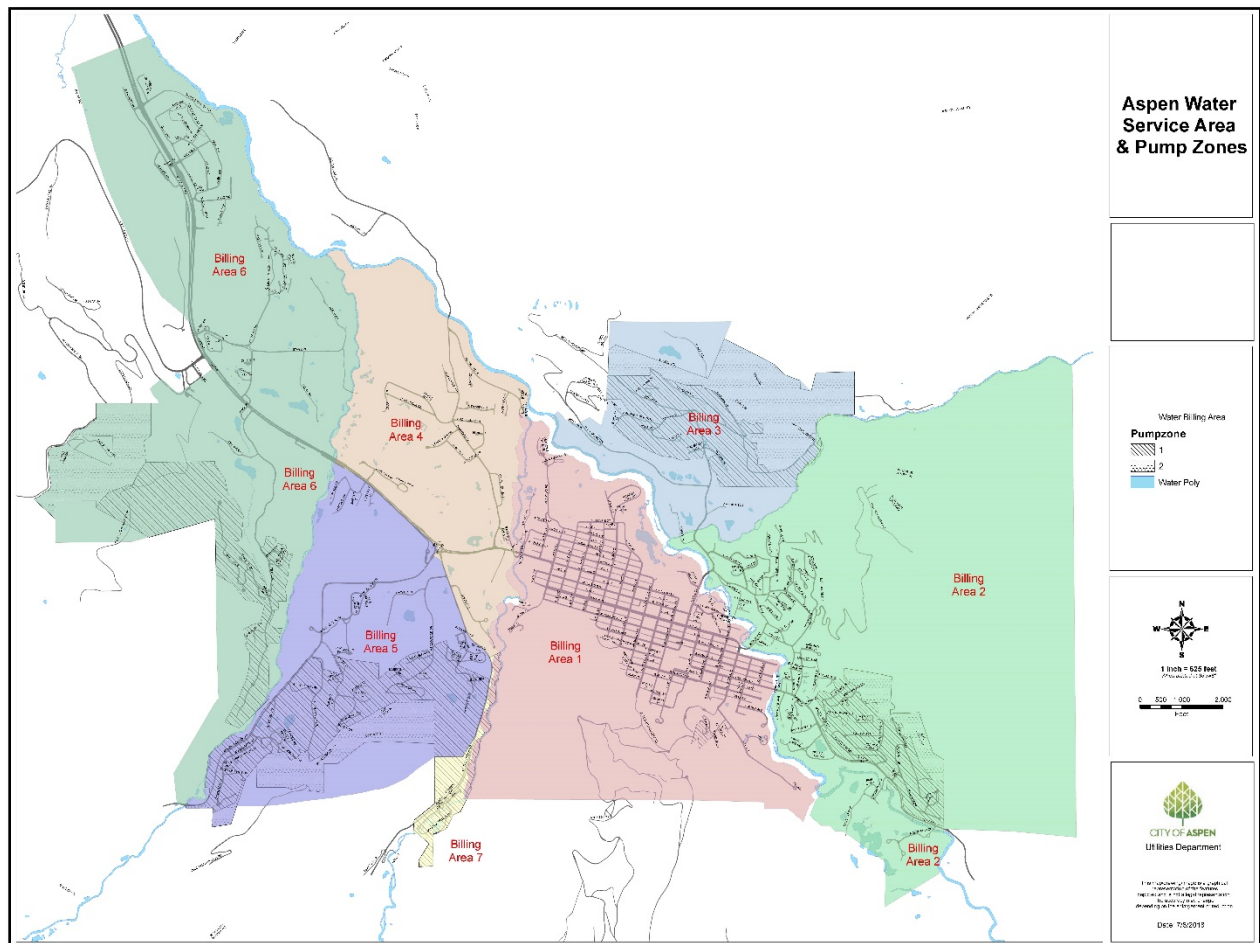
Figure 4: City of Aspen General Location Map



*\*Map from U.S. Department of Interior – Bureau of Reclamation*



Figure 5: City of Aspen Water Service Area Location Map



## 4. TECHNICAL PROJECT DESCRIPTION

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### 4.1 METER REPLACEMENT

Aspen Water Utility provides service to approximately 4,000 accounts located inside and outside the Aspen Municipal boundary. Out of those accounts, there are 3,400 residential accounts and 600 commercial accounts. Within the infrastructure of the Aspen Water Utility, the property owner owns, and is responsible for, their water service line, curb box valve and water meter<sup>4</sup>. Aspen has begun efforts supporting an AMI project implementation wherein water accounts will be receiving intelligent technology that will be hooked up to their existing water meter and allow for 2-way communication between the utility and the customer. Approximately 10% of the existing water meters have been identified as incompatible with these system upgrades and are non-compliant with current City Standards, requiring a full replacement of approximately 379 identified water meters. **The proposed Meter Replacement Project will include meter equipment and installation costs for all incompatible and non-compliant meters.**

In 1987, Aspen published a set of Water Distribution Standards requiring all newly installed meters to meet certain defined specifications. Records for all customer meters within Aspen's distribution system have been sorted based on installation date to estimate meter age. Those meters installed prior to 1987 are out of compliance with current design standards and are predominantly incompatible with the selected AMI technology and will be replaced under this project. The City will purchase approximately 379 compliant and AMI compatible meters for installation for the meter sizes estimated below in Table 2.

**Table 2: Estimated Number of Meters Identified for Replacement**

<b>Meter Size</b>	<b>Estimated Number of Units</b>
0.75"	220
1.0"	80
1.5"	35
2.0"	35
4.0"	9
<b>TOTAL</b>	<b>379</b>

Per City of Aspen 2019 Water Distribution Standards, all meters shall be Badger, Kamstrup, or Elster AMCO brand meters. For smaller meters, only the specified Badger or Kamstrup brand meters comply with these standards, as detailed below. All large meter applications (greater than 3 inches) shall use the Elster AMCO EvoQ4 electromagnetic stainless-steel water meter<sup>5</sup>.

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<sup>4</sup> City of Aspen Municipal Code Section 25.12.130 and Section 25.12.150

<sup>5</sup> City of Aspen Water Distribution Standards Section 5.8

Specifications are as follows:

All meters shall be Badger, Kamstrup or Elster AMCO brand meters.

**(1) Badger Water Meter Specifications for the City of Aspen (Approved for Horizontal Installation ONLY)**

- ☐ ¾" Badger Recordall disc meter in cast bronze and cast iron bottom with an absolute digital encoder (HR-E) register with 3 bare wires from register for connection to the Aclara Meter Transmitting Unit (MTU).
- ☐ 1.0" Badger Recordall disc meter in cast bronze and cast iron bottom with an HRE register with 3 bare wires from register for connection to the Aclara MTU.
- ☐ 1.5" Badger Recordall disc meter in cast bronze with an ADE register with 3 bare wires from register for connection to the Aclara MTU.

For Technical Briefs please visit [www.badgermeter.com](http://www.badgermeter.com)

**(2) Kamstrup Water Meter Specifications for the City of Aspen (Approved for Horizontal or Vertical Installation in upward flow)**

- ☐ ¾" Kamstrup Water Meter flowIQ 2100 Smart Ultrasonic Water Meter with Encoded Output (EO) with 3 bare wires from register for connection to the Aclara MTU.
- ☐ 1.0" Kamstrup Water Meter flowIQ 3101 Smart Ultrasonic Water Meter with Encoded Output (EO) with 3 bare wires from register for connection to the Aclara MTU.
- ☐ 1.5" Kamstrup Water Meter flowIQ 3101 Smart Ultrasonic Water Meter with Encoded Output (EO) with 3 bare wires from register for connection to the Aclara MTU.
- ☐ 2.0" Kamstrup Water Meter flowIQ 3101 Smart Ultrasonic Water Meter with Encoded Output (EO) with 3 bare wires from register for connection to the Aclara MTU.

For Technical Briefs please visit [www.kamstrup.com](http://www.kamstrup.com)

Based on Aspen's Municipal Code and 2019 Water Distribution Standards, the account holder owns the water meter and it is the responsibility of the account owner to repair or replace meters. Because replacement of these meters is being required by the City of Aspen for compliance and integration in the AMI program, Aspen would like to fund the purchase and installation costs associated with the meter replacement project described herein. If awarded this grant, Aspen will cover these costs in their entirety.

A Request for Qualifications ("RFQ") for meter installation will be drafted and a competitive proposal process will be managed by Aspen and will follow requirements as set forth in the City of Aspen Procurement Code. The winning bid will be selected in fall of 2019.

Benefits for the meter replacement project to support the Enhanced Water Loss Control program in Aspen include:

- Capital asset program optimization
- Water system integrity – leak detection
- Replacement of aging meter infrastructure
- Compatibility with technology to support rate design flexibility
  - Dynamic pricing
  - Time of day
  - Water budget
  - EV rates
- Electric outage management
  - Outage detection and restoration
  - Preventable outage maintenance

- Improved accounting of water usage
- Data to further support water efficiency programs

## **4.2 PUBLIC OUTREACH**

A targeted public outreach plan and program will be developed to specifically address and communicate with those customers with meters installed prior to 1987. Information in this communication will include benefits of replacing aging infrastructure, City policy on customer ownership of meters and how, notwithstanding requirements specified in the City's Municipal Code, the City will be fully funding the meter purchase and installation through the support of this grant. The outreach will also inform customers regarding what to expect from upcoming communication related to the new AMI program. The City will contract directly with the public relations firm that is currently contracting with Aspen as part of the broader AMI outreach program. This firm will develop a plan for outreach and engagement associated directly with the meter replacement program as part of the grant project and budget. Coordinating communications and outreach between the meter replacement program and the AMI program will aid the City in providing a consistent and effective messaging plan and will help realize levels of time efficiency in developing the materials. A consistent look and feel to the materials will help the public familiarize themselves with the outreach approach and repeat key messages for engagement and education.

## **4.3 EVALUATION OF SAVINGS AND BENEFITS AND REPORTING**

Implementing and operating a robust metering program in the City of Aspen is fundamental to the success of the City's water conservation and efficiency efforts. This technology will empower the City's Enhanced Water Loss Control program with data to identify customer-side leaks, providing the information to systematically target and reduce water distribution system losses. Replacement of aging infrastructure can influence large water savings, and water losses within the City's distribution system are potentially large. Replacement of older water meters is expected to reduce water losses by approximately 3,128 gallons per month for each residential meter and approximately 7,360 gallons per month for each commercial meter. Estimated savings for replacement of each meter is based on an aging infrastructure evaluation prepared by the City of Aspen, described in more detail in Section 5 of this application. By more efficiently managing uses of water, the City will also increase its efficiency in energy management.

Actual savings associated with the meters that are replaced will be quantified by comparing customer account pre-replacement water use to post-replacement use, for those months with available data at the time of the final submitted report. A final inventory of the meter types and sizes replaced under this project will be documented and used to refine anticipated annual savings for replacement of this aging infrastructure.

Additional water loss audit evaluation will continue during and beyond this project and will include advanced water demand investigation efforts. This will support future meter replacement savings estimates on aging meters and will support potential policy changes. Quantified savings utilizing available data will be documented and provided in the interim and final reports as required by this grant.

## **4.4 SCHEDULE**

The City of Aspen will develop an RFQ for meter installation services to support this project in early fall of 2019. City staff will have a full inventory of aged meters to be replaced and will directly order those replacement meters upon grant award. The bid will be awarded to the selected meter installation contractor and a plan for installation for the inventoried meters will be developed and commence, with

all work to be completed by fall of 2020, unless otherwise directed by Council. Agreements with the communications contractor engaged for the outreach and communications tasks as well as the consulting group engaged for the savings quantification and report development support will be completed in fall of 2019 with work to begin following the finalization of the meter replacement plan. Work for these two groups will extend through the end of 2020 to complete and satisfy all reporting requirements associated with this grant award.



## 5. TECHNICAL PROPOSAL: EVALUATION CRITERIA

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### 5.1 QUANTIFIABLE WATER SAVING (30 POINTS)

*Describe the amount of estimated water savings. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

The average annual water demand in the City of Aspen is approximately 3,000 acre-feet. Replacement of aging meters, especially those meters with plastic bodies, will increase efficiency and reduce leaks. This project is estimated to reduce water loss by about 50.5 acre-feet per year through the replacement of meters installed prior to 1987. As an integral tool in Aspen's comprehensive water efficiency program, it will also support implementation of programs identified in the WEP related to advanced rate structures, water budgeting and outdoor water demand management, that collectively are estimated to result in over 300 acre-feet per year of savings by the year 2035.

*Describe current losses: Please explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

An Enhanced Water Loss Control program was identified as a targeted water efficiency program in Aspen's WEP, with a projected annual water savings of 38 acre-feet. This projected savings was developed using demands that quantified water loss at only 4%. Since the development of this plan, two stages of water loss audit evaluations have been completed, identifying higher estimated water loss than previously stated in the WEP.

The recent water loss audits used the IWA/AWWA Water Audit Method and M36 Manual for Water Audits and Loss Control Programs. Based on the most recent water loss audit findings, approximately 180 acre-feet in losses directly associated with inaccurate or leaky meters are estimated within the City of Aspen distribution system.

Conserved water will impact streamflow by reducing the amount of water diverted for municipal use at the City's headgate. The application of improved meter data to implement a comprehensive suite of programs in the City's WEP will also lead to reductions in consumptive uses that will benefit the local streamflow, the Roaring Fork River, and the Colorado River. Conserved water also increases resiliency by reducing the City's vulnerability to low streamflow periods associated with hydrological variability and natural disasters. To this end, it has the potential to increase resiliency for other downstream municipal water providers who rely on the Roaring Fork and Colorado Rivers.

*Describe the support/documentation of estimated water savings:*

In 2017, the City of Aspen conducted an evaluation to quantify losses and costs to support the age at which meters should be replaced within the City due to reading inaccuracies. This included a calculation of the Real Meter Accuracy for meters within four different meter age groups. For purposes of estimating savings for this project, the Real Meter Accuracy for meters 30 years and older was used, calculated at a value of 0.816. This represents a meter underreporting by about 18.4%, which is consistent with the Colorado WaterWise Best Practices estimate that typical water savings achieved through metering are in

the range of 10-40%<sup>6</sup>. Residential meters in Aspen observe average demands of 17,000 gallons per month and commercial meters in Aspen observe average demands of 40,000 gallons per month.

This approach estimates that residential meters greater than 30 years old (which will all be replaced under this project) underestimate demand by around 3,128 gallons each month and commercial meters greater than 30 years old underestimate demand by around 7,360 gallons each month. Estimated savings for identified residential and commercial meters is shown in Table 3.

**Table 3: Estimated Savings for Replacement of Identified Out of Compliance Residential and Commercial Meters**

<b>Meter Customer Type</b>	<b>Meter Size Range</b>	<b>Number of Meters</b>	<b>Average Annual Demand (AF/yr/meter)</b>	<b>Total Annual Demand (AFY)</b>	<b>Total Estimated Savings (AFY)</b>
Residential	0.75" to 1.5"	335	0.63	211	38.8
Commercial	2" to 4"	44	1.47	64.7	11.9
<b>Total</b>		<b>379</b>		<b>275.7</b>	<b>50.7</b>

#### ***Municipal Metering:***

- a. How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

Based on calculations developed by the City of Aspen to determine water savings and optimum life of aging water meters, meters greater than 30-years old are under-reading water demands by approximately 18.4%. All meters to be replaced under this project exceed this 30-year age, with a total of 379 of these meters identified through a customer accounts query through the City's billing accounts software. Calculations showing this methodology are included below.

$$\text{Estimated Residential Water Savings} = (0.63 \text{ AF/meter/year}) \times (335 \text{ meters}) \times (1-0.816) = 38.8 \text{ AF/year}$$

$$\text{Estimated Commercial Water Savings} = (1.47 \text{ AF/meter/year}) \times (44 \text{ meters}) \times (1-0.816) = 11.9 \text{ AF/year}$$

$$\text{Total Estimated Water Savings} = 38.8 \text{ AF/year} + 11.9 \text{ AF/year} = 50.7 \text{ AF/year}$$

- b. How have current distribution system losses and/or the potential for reductions in water use by individual users been determined?*

The City of Aspen has evaluated distribution system losses using the IWA/AWWA Water Audit Method and M36 Manual for Water Audits and Loss Control Programs. Ongoing system and water loss evaluations have been recommended based on these two phases to better quantify volume and nature of system losses. Projected savings under this project have been calculated by applying the average anticipated

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<sup>6</sup> Colorado WaterWise Guidebook of Best Practices for Municipal Water Conservation in Colorado (2010).

losses for meters older than 30-years and applying those losses to the identified meters for replacement. Leaks and mis-reads due to aging meters will be resolved and result in water savings in the identified meters.

- c. For installing individual water user meters, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.*

The City of Aspen evaluated savings for replacement of aging water meters using the Real Meter Accuracy case study described above to calculate meter accuracy for multiple meter age ranges. The calculated real meter accuracy for meters greater than 30 years was about 0.816, which was then applied to the average monthly residential use of 17,000 gallons<sup>7</sup>. This would save about 3,128 gallons per month per replaced residential water meter at 30-years old. For commercial meters, the average monthly demand is about 40,000 gallons, resulting in an estimated savings of 7,360 gallons per month per replaced commercial meter at 30-years old.

Another recent analysis completed by St. Charles Mesa Water District (a water utility district in Pueblo, Colorado) estimated about 1,900 gallons per month per meter saved for replacing water meters in their district. This was reported in their revised Municipal WEP currently under review. Note that this does not just represent meters older than 30-year, so estimated savings are lower than the savings estimated for Aspen per meter. Losses in meters are estimated to increase over time, resulting in higher losses for older meters.

- d. If installing distribution main meters will result in conserved water, please provide support for this determination (including, but not limited to leakage studies, previous leakage reduction projects, etc.). Please provide details underlying any assumptions being made in support of water savings estimates (e.g., how leakage will be reduced once identified with improved meter data).*

Main distribution meters will not be replaced under this grant program.

- e. What types (manufacturer and model) of devices will be installed and what quantity of each?*

Per City of Aspen 2019 Water Distribution Standards, all meters shall be Badger, Kamstrup, or Elster AMCO brand meters. For smaller meters, only the specified Badger or Kamstrup brand meters comply with these standards. All large meter applications (greater than 3 inches) shall use the Elster AMCO EvoQ4 electromagnetic stainless-steel water meter<sup>8</sup>. Meter sizes identified for replacement and the quantity of each is shown below in Table 4.

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<sup>7</sup> Average monthly use based on 2017 demands.

<sup>8</sup> City of Aspen Water Distribution Standards Section 5.8

**Table 4: Estimated Number of Meters Identified for Replacement**

<b>Meter Size</b>	<b>Estimated Number of Units</b>
0.75"	220
1.0"	80
1.5"	35
2.0"	35
4.0"	9
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*f. How will actual water savings be verified upon completion of the project?*

Demands prior to and following replacement of meters under this program will be compared for each selected account and will be tracked to quantify long-term savings. This will support future meter replacement savings estimates on aging meters and will support potential policy changes. Additional water loss audit evaluations will continue during and beyond this project and will include advanced demand investigation efforts.

## 5.2 WATER RELIABILITY (18 POINTS)

*3. Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?*

- *Is there widespread support for the project?*

This project is directly supported by the City of Aspen and its water users, the Colorado Water Conservation Board, the Roaring Fork Conservancy, Aspen CORE, and WaterNow Alliance. Additionally, general support for implementation of smart-metering is identified in the Colorado Water Plan as a conservation strategy and demand reduction measure. The CWCB and the Colorado Water Plan support water management activities including smart-metering, comprehensive water loss management programs, savings tracking and estimating tools, and improved data collection on customer water uses.

The Roaring Fork Regional WEP, developed through collaboration with 5 water utilities and other local agencies in the Roaring Fork Watershed including City of Aspen, identifies water losses control, including management of real water losses and apparent losses due to meter inaccuracy, as a targeted program to address regionally.

- *What is the significance of the collaboration/support?*

The CWCB is currently implementing the Colorado Water Loss Initiative to provide free training and technical support to urban water providers throughout Colorado, along with recommended next steps for water loss reduction and revenue recovery. Aspen has already conducted the AWWA M36 water loss audit that is being used for the CWCB trainings, and this metering replacement program provides an example of the next steps that come from the information learned under such audits. The City of Aspen's initiative to take steps to reduce water loss is exemplary of the water smart management being promoted by the CWCB. Ongoing support from the CWCB has provided funding opportunities to the City to advance other water efficiency programs and projects that bolster the City's WEP.

- *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes. Aspen is a leader in the Roaring Fork Watershed in conservation and efficiency practices. The City provides lessons-learned information to its municipal partners under the Roaring Fork Regional WEP working group and is often relied upon by this group to pave the way by initiating the Regional WEP water efficiency programs. Programs and projects implemented by Aspen allow it to lead by example with the surrounding communities. Local programs, like this meter replacement program, can provide locally quantified water savings from a meter replacement program for other communities to establish their targeted goals through similar programs.

## 5.3 IMPLEMENTING HYDROPOWER (18 POINTS)

*Up to 18 points may be awarded for this criterion. This criterion prioritizes projects that will install new hydropower capacity in order to utilize our natural resources to ensure energy is available to meet our security and economic needs.*

The proposed project does not include new hydropower capacity.

#### **5.4 COMPLEMENTING ON-FARM IRRIGATION IMPROVEMENTS (10 POINTS)**

*Up to 10 points may be awarded for projects that describe in detail how they will complement on-farm irrigation improvements eligible for NRCS financial or technical assistance*

The proposed project does not include on-farm irrigation improvements.

#### **5.5 DEPARTMENT OF THE INTERIOR PRIORITIES (10 POINTS)**

*Creating a conservation stewardship legacy second only to Teddy Roosevelt*

The City of Aspen is committed to the efficient and effective use of water as a precious resource. The City takes seriously its responsibility of being located at the headwaters of the Roaring Fork Watershed in the Upper Colorado River Basin, protecting the quality and availability of water through the river system downstream. Aspen has adopted a policy to maintain streamflows in the creeks downstream of its diversion structures at flow rates at or above the Colorado Water Conservation Board's decreed instream flow rights for the protection of the fishery and the associated aquatic habitats in those streams. It has become the first utility in the State of Colorado to adopt the Qualified Water Efficient Landscape Certification Program and have recently adopted some of the most rigorous Water Efficient Landscaping and Irrigation Standards in the state. The City takes very seriously its stewardship and leadership position as a water utility.

*Utilizing our natural resources*

In addition to the ongoing efforts through projects and programs to most efficiently utilize its water resources, the City of Aspen was the first city west of the Mississippi to have hydroelectric powered street lights. It was built to service the mines in the area and municipal power was an afterthought. Today, the City of Aspen electric system uses 100% renewable energy (46% hydroelectric, 53% wind power, 1% landfill gas).

*Modernizing our infrastructure*

This project focuses on replacing the oldest water meters operating within Aspen's distribution system. This project will also help to build an aging infrastructure policy to require the replacement of water meters once a certain age is hit. Water savings realized from this project will be used to reevaluate the City's policy regarding the mandated age for replacement. The entire distribution system is undergoing a transition to an AMI system for every meter within the City's service area. This will include all water and electrical meters, modernizing infrastructure for both water and energy utilities.

#### **5.6 IMPLEMENTATION AND RESULTS (6 POINTS)**

*Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place?*

Yes, the City of Aspen has a State Approved Municipal Water Efficiency Plan (“WEP”)<sup>9</sup>. Enhanced Water Loss Control was identified as a program for implementation under this WEP, which this proposed project directly supports. The City is also one of the primary participants in the Roaring Fork Regional WEP.

*Provide the following information regarding project planning:*

*(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.*

The Aspen WEP provides support for the proposed project through the identification and prioritization of and Enhanced Water Loss Control program. This project is also supported by the Roaring Fork Regional WEP through identification of identify water distribution audits and reduction in losses due to meter inaccuracy as a targeted program to address regionally.

*(2) Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).*

The CWCB and the Colorado Water Plan identify and support water management activities including smart-metering, comprehensive water loss management programs, water savings tracking and estimating tools, and improved data collection on customer water uses. Implementation of smart-metering is identified in the Colorado Water Plan as a key conservation strategy and demand reduction measure.

#### *E.1.6.2. Subcriterion F.2— Performance Measures*

*Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved). For more information calculating performance measure, see Appendix A: Benefit Quantification and Performance Measure Guidance.*

All replaced meter locations have historic metered demand data and, following replacement, will continue recording demands through the next phase of AMI system integration. Demands are tracked monthly through the City’s billing software. The difference between the current water use and the water use after the meter replacement will be calculated for each account. The total calculated difference will be compared to the estimated savings of 50.7 AF/year included in this project application.

#### *E.1.6.3. Subcriterion F.3— Readiness to Proceed*

*Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.*

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<sup>9</sup> <https://www.cityofaspen.com/DocumentCenter/View/466/City-of-Aspen-Municipal-Water-Efficiency-Plan-2015-PDF>



The City of Aspen will develop an RFQ for meter installation services to support this project in early fall of 2019. City staff will have a full inventory of aged meters to be replaced and will directly order those replacement meters upon grant award. The bid will be awarded to the selected meter installation contractor and a plan for installation for the inventoried meters will be developed and commence, with all work to be completed by fall of 2020. Agreements with the communications contractor engaged for the outreach and communications tasks as well as the consulting group engaged for the savings quantification and report development support will be completed in fall of 2019 with work to begin following the finalization of the meter replacement plan. Work for these two groups may extend through the end of 2020 to complete and satisfy all reporting requirements associated with this grant award.

## 5.7 NEXUS TO RECLAMATION PROJECT ACTIVITIES (4 POINTS)

*Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.*

*Is the proposed project connected to Reclamation project activities? If so, how? Please consider the following:*

The proposed project is not connected to Reclamation project activities.

## 5.8 ADDITIONAL NON-FEDERAL FUNDING (4 POINTS)

*State the percentage of non-Federal funding*

$$\frac{\$271,159.68 \text{ Non - Federal Funding}}{\$542,159.68 \text{ Total Budget}} = 50.01\% \text{ Non - Federal Funding}$$

Source	Amount
Costs to be reimbursed with the requested Federal Funding	\$ 271,000.00
Costs to be paid by applicant	\$ 271,159.68
Value of third-party contributions	\$ -
Total Project Cost	\$ 542,159.68



## 6. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

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To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, we have included responses to the following list of provided questions focusing on the NEPA, ESA, and NHPA requirements.

*Will the proposed project impact the surrounding environment (e.g., soil[dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.*

Meters that will be replaced under this project are located within residences or commercial buildings. No earth-disturbing work will occur, resulting in no impacts on the surrounding environment.

*Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?*

It is not anticipated that any threatened or endangered species or designated critical habitat will be affected by any activities associated with the proposed project.

*Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?” If so, please describe and estimate any impacts the proposed project may have.*

There are no wetlands or other surface waters inside the project boundaries that will be impacted by the proposed project.

*When was the water delivery system constructed?*

The earliest parts of the water delivery system were constructed in the late-1800s. In 1956, the City of Aspen began operating the Municipal Water Utility. In 1957, Aspen voters approved a bond proposal adopting a plan for acquisition and improvement of the water works system and for repayment of the costs incurred in the acquisition and improvement program.

*Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.*

There will be no modification of or effects to any portion of an irrigation system because of this project.

*Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.*

There is no anticipated impact to any buildings, structures, or features listed or eligible for listing on the National Register of Historic Places. A cultural resource inventory review will be completed as part of the project.

*Are there any known archeological sites in the proposed project area?*

There are no known archeological sites in the proposed project area.

*Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?*

There will be no disproportionately high or adverse effects on low income or minority populations because of this project.

*Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*

The proposed project will not impact tribal lands or access to/ceremonial use of Indian sacred sites.

*Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*

The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

## 7. REQUIRED PERMITS OR APPROVALS

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There are no required permits identified or anticipated for the proposed project. All project work will be conducted at existing meter locations. Any project-related approvals will be managed by the City of Aspen. The project will require review and approval by the City Council prior to project initiation. We do not anticipate needing any permitting with any outside authorities or permitting entities.

## 8. OFFICIAL RESOLUTION

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The next Council meeting will be held on April 8<sup>th</sup>, during which an Official Resolution will be presented and signed. This will be provided in support of this grant application upon completion.

## 9. PROJECT BUDGET

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The project budget includes:

- (1) Funding plan and letters of commitment (N/A)
- (2) Budget proposal
- (3) Budget narrative

### 9.1 FUNDING PLAN AND LETTERS OF COMMITMENT

*Describe how the non-Federal share of project costs will be obtained. Please identify the sources of the non-Federal cost share contribution for the project, including:*

- *Any monetary contributions by the applicant towards the cost-share requirement and source of funds (e.g., reserve account, tax revenue, and/or assessments)*
- *Any costs that will be contributed by the applicant*

The City of Aspen will fund the non-Federal share of project costs from their Enterprise Fund for Water Utility which is fully funded through revenue from monthly billing, tap fees, permit review fees, and other miscellaneous revenue sources.

*In addition, please identify whether the budget proposal includes any project costs that have been or may be incurred prior to award. For each cost, describe:*

No project costs will be incurred prior to award.

**Table 5: Total Project Cost: Summary of Federal and Non-Federal Funding Sources**

<b>Funding Source</b>	<b>Amount</b>
Costs to be reimbursed with the requested Federal Funding	\$ 271,000.00
Costs to be paid by applicant	\$ 271,159.68
Value of third-party contributions	\$ 0.00
<b>Total Project Cost</b>	<b>\$ 542,159.68</b>

## 9.2 BUDGET PROPOSAL

**Table 6: Proposed Project Budget**

Budget Item Description	\$/Unit	Quantity	Quantity Type	Total Cost
<b>Salaries and Wages</b>				
Project Manager	\$ 45.98	60	HR	\$ 2,758.80
<b>Fringe Benefits</b>				
Full-Time Employees*	\$ 4.60	60		\$ 275.88
Part-Time Employees				\$ -
<b>Travel</b>				
				\$ -
<b>Equipment</b>				
<b>Supplies and Materials</b>				
Replacement Meter (Average Unit Cost)	\$ 275.00	379	EA	\$ 104,225.00
<b>Contractual/Construction</b>				
Meter Installation (Average per Unit)	\$ 1,100.00	379	EA	\$ 416,900.00
Customer Outreach and Engagement			EA	\$ 8,000.00
Savings Tracking and Reporting			EA	\$ 10,000.00
<b>Third-Party Contributions</b>				
				\$ -
<b>Other</b>				
				\$ -
<b>Total Direct Costs</b>				<b>\$ 542,159.68</b>
<b>Indirect Costs</b>				
Type of Rate	Percentage	\$base		\$ -
<b>TOTAL ESTIMATED PROJECT COSTS</b>				<b>\$ 542,159.68</b>

\*Calculated as 10% of the hourly wages for staff under "Salaries and Wages"

## 9.3 BUDGET NARRATIVE

The budget narrative provides a discussion of, or explanation for, items included in the budget proposal. The types of information to describe in the narrative include, but are not limited to, those listed in the following subsections.

### 9.3.1 SALARIES AND WAGES

The salaries and wages include staff time to administer and manage the program and to coordinate contracting entities. The Project Manager for this project is Lee Ledesma, Finance and Administrative Manager for the Utilities Department at the City of Aspen. Ms. Ledesma will be responsible for working with consultants on the development and submittal of a fully completed form SF-425 Federal Financial Report, an interim program performance report, and the final performance report to Reclamation upon completion of the project. Labor rates and estimated hours included in this proposal are included in Table 6. Hourly rate represents staff direct hourly wages. Hours spent directly contributing to this project will be tracked and reported as a portion of the matching fund contributions.

### 9.3.2 FRINGE BENEFITS

A fringe benefit cost rate applied to staff hourly labor is 10% of direct hourly wages. The City does not have a federally approved indirect cost rate agreement and is therefore using the de minimis 10% rate. Indirect costs associated with this 10% rate include, but are not limited to, administrative salaries, payroll and procurement services, staff healthcare contributions, and organizational administration.

### 9.3.3 TRAVEL

Travel is not anticipated for this project.

### 9.3.4 EQUIPMENT

No equipment valued at greater than \$5,000 per unit is included in this project. All purchase costs associated with new meters is included under Section 9.3.5 Materials and Supplies.

### 9.3.5 MATERIALS AND SUPPLIES

Equipment will be purchased by the City of Aspen for this project. New, water meters that are compliant with current City Standards and compatible with the new AMI system will be purchased for the estimated average unit cost of \$275 per meter, noting that the cost will be directly associated with the meter size. Average unit cost was provided by the National Meter & Automation and Mountain States Pipe & Supply in support of the associated AMI Project recently awarded and was estimated based on anticipated unit types and other recently purchased meters. An estimated of number of meters to be purchased by size is included in Table 7 below. Number of meters was determined based on an inventory query of Aspen's customer accounts for all meters installed prior to 1987 as these are all out of compliance with current City Standards. Number of units for each meter size category was estimated based on available meter size data for the same query. Note that meter size is not included for each customer account dating back pre-1987.

**Table 7: Summary of Meter Sizes for Meters to be Replaced**

<b>Meter Size</b>	<b>Estimated Number of Units</b>
0.75"	220
1.0"	80
1.5"	35
2.0"	35
4.0"	9
<b>TOTAL</b>	<b>379</b>

### 9.3.6 CONTRACTUAL

The City of Aspen will bid the meter installation portion of the project, requesting proposals through a competitive bid process from local plumbing contractors. The contractual costs included in this budget proposal are estimates for each meter install as provided by the selected contractors completing the work for the associated AMI project. The contractor will be selected based on qualifications and proposed

budget. All procurements in excess of \$50,000 shall be approved by City Council by motion or resolution as required by City of Aspen's Title 4 Procurement Code.

The City is budgeting \$8,000 for customer outreach and engagement and will contract directly with a public relations firm that is currently contracting with Aspen as part of the greater AMI outreach program. This firm will provide an estimate and plan for outreach and engagement associated with the meter replacement program as part of this project and budget. Because the budgeted amount does not exceed the \$10,000 threshold, the City is able to contract directly without a competitive bid under the requirements within this Reclamation grant program. Per City Procurement Code, this amount falls under the Small Purchases threshold and is exempt from a competitive bid requirement.

The City is budgeting \$10,000 for services to quantify associated water savings and efficiencies and to support the development of the required project performance reports for submittal to Reclamation. Because the budgeted amount does not exceed the \$10,000 threshold, the City is able to contract directly without a competitive bid under the requirements within this Reclamation grant program. Per City Procurement Code, this amount falls under the Small Purchases threshold and is exempt from a competitive bid requirement.

#### 9.3.7 THIRD-PARTY IN-KIND CONTRIBUTIONS

No work included with this project will be accomplished by third-party contributors.

#### 9.3.8 ENVIRONMENTAL AND REGULATORY COMPLIANCE COSTS

The City of Aspen does not anticipate any environmental and regulatory compliance costs. All work will be completed within existing active customer residences and commercial buildings.

#### 9.3.9 OTHER EXPENSES

None.

#### 9.3.10 INDIRECT COSTS

No indirect costs are included in this project budget.



## 10. LETTERS OF SUPPORT

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Kevin Reidy, Colorado Water Conservation Board

Christina Medved, Roaring Fork Conservancy District

Marty Treadway, Aspen CORE

Cynthia Koehler, WaterNow Alliance



**COLORADO**

**Colorado Water  
Conservation Board**

Department of Natural Resources  
1313 Sherman Street, Room 718  
Denver, CO 80203

March 12, 2019

Lee Ledesma  
Finance and Administrative Manager  
Utilities Department  
130 South Galena St.  
Aspen, CO 81611

Subject: U.S. Bureau of Reclamation WaterSMART Water and Energy Efficiency Grant

Dear Ms. Ledesma,

As the State Water Efficiency Technical Specialist with the Colorado Water Conservation Board ("CWCB"), I am pleased to express our support for the City of Aspen's U.S. Bureau of Reclamation WaterSmart Water and Energy Efficiency Grant application for Meter Replacement in Support of Enhanced Water Loss Control.

Over the past several years, the CWCB has worked closely with the City of Aspen to advance its Municipal Water Efficiency Plan ("WEP") and support the implementation of water efficiency programs in Aspen and throughout the Roaring Fork Valley. Aspen has shown an ongoing commitment to efficient water use and stewardship of this limited resource through its own municipal water efficiency program as well as through participation in the Roaring Fork Watershed Regional Municipal Water Efficiency Plan.

We understand that the City has identified certain water meters within its service area that are incompatible with the Advanced Metering Infrastructure ("AMI") system that it is transitioning to. Replacing these meters to make the entire service area operable under the AMI system will support multiple projects identified in the 2015 WEP update. As stated in the WEP, a robust metering program is fundamental to the success of water conservation efforts. This technology will help the City with its enhanced water loss control program by identifying customer-side leaks and reducing water distribution system losses. The AMI program will also allow the City to expand the use of real-time water demand data to support water budgets that are being implemented through its water efficient landscaping ordinance and conservation-oriented rates. Further, it will provide information to the City and its customers that is critical for implementing the City's municipal water shortage and drought



management and response plan. By more efficiently managing uses of water, the City will also increase its efficiency in energy management.

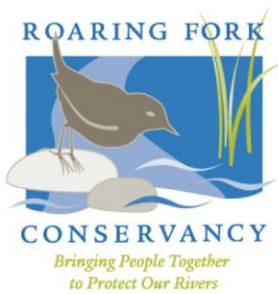
The CWCB is committed to the practices, techniques, and technologies that extend water supplies and energy resources through water efficiency programs. We support the City of Aspen's grant application for Meter Replacement in Support of Enhanced Water Loss Control.

If you have any further questions, please feel free to contact me at [kevin.reidy@state.co.us](mailto:kevin.reidy@state.co.us) or 303-866-3441 x3252.

Sincerely,

A handwritten signature in cursive script that reads "Kevin D. Reidy". The signature is written in dark ink and is positioned above the typed name and title.

State Water Efficiency Technical Specialist  
Colorado Water Conservation Board



March 13, 2019

Ms. Lee Ledesma  
Finance and Administrative Manager  
Utilities Department  
130 South Galena St.  
Aspen, CO 81611

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*Water Quality Program  
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Sheryl Sabandal  
*Development Manager*

Subject: U.S. Bureau of Reclamation WaterSMART Water and Energy Efficiency Grant

Dear Ms. Ledesma,

Roaring Fork Conservancy (RFC) is submitting our support for the City of Aspen's U.S. Bureau of Reclamation WaterSmart Water and Energy Efficiency Grant application for Meter Replacement in Support of Enhanced Water Loss Control. As the watershed organization for the Roaring Fork Valley for the last 23 years, whose mission is to inspire people to explore, value, and protect the Roaring Fork Watershed, teaching about water conservation has always been a focus in our education and outreach programs. As the City of Aspen is in the headwaters of our namesake watershed, RFC has had the privilege of collaborated on many projects with City of Aspen. One such example was partnering with the City of Aspen along with all the municipal water providers in the Roaring Fork Valley to write the Roaring Fork Watershed Regional Water Efficiency Plan in 2015. The City of Aspen is a consistent leader in implementing water saving measures and practices identified in the Plan, which RFC shares with other communities on a regular basis.

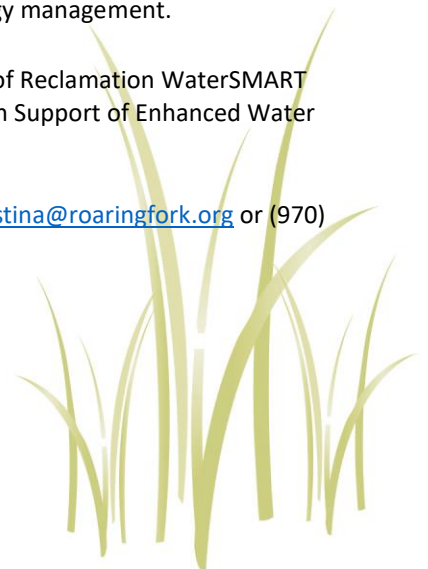
Through the City's commitment to efficiency, the City has identified certain water meters within its service area that are incompatible with the Advanced Metering Infrastructure ("AMI") system that it is transitioning to. Replacing these meters to make the entire service area operable under the AMI system will support multiple projects identified in the 2015 WEP update and the City's ongoing water efficiency efforts. This technology will help the City with its enhanced water loss control program by identifying customer-side leaks and reducing water distribution system losses. The AMI program will also allow the City to expand the use of real-time water demand data to support water budgets that are being implemented through its water efficient landscaping ordinance and conservation-oriented rates. Further, it will provide information to the City and its customers that is critical for implementing the City's municipal water shortage and drought management and response plan. By more efficiently managing uses of water, the City will also increase its efficiency in energy management.

For these reasons, we strongly support the City of Aspen's U.S. Bureau of Reclamation WaterSMART Water and Energy Efficiency Grant application for Meter Replacement in Support of Enhanced Water Loss Control.

If you have any further questions, please feel free to contact me at [christina@roaringfork.org](mailto:christina@roaringfork.org) or (970) 927-1290 x. 103.

Sincerely,

Christina Medved, M.A.  
Director of Community Outreach





Lee Ledesma  
Finance and Administrative Manager  
Utilities Department  
130 South Galena St.  
Aspen, CO 81611

Subject: U.S. Bureau of Reclamation WaterSMART Water and Energy Efficiency Grant

Dear Ms. Ledesma,

The Community Office for Resource Efficiency (CORE) would like to submit our support for the City of Aspen's U.S. Bureau of Reclamation WaterSmart Water and Energy Efficiency Grant application for Meter Replacement in Support of Enhanced Water Loss Control. Throughout CORE's 25-year history, we have supported water and resource efficiency here in the Roaring Fork Valley. In 2013, CORE was instrumental in creating a regional water conservation plan, which included the City of Aspen. In 2016, CORE implemented a water conservation and rain barrel procurement program targeted at homeowners in the Roaring Fork Valley.

Through the City's commitment to efficiency, the City has identified certain water meters within its service area that are incompatible with the Advanced Metering Infrastructure ("AMI") system that it is transitioning to. Replacing these meters to make the entire service area operable under the AMI system will support multiple projects identified in the 2015 WEP update and the City's ongoing water efficiency efforts. This technology will help the City with its enhanced water loss control program by identifying customer-side leaks and reducing water distribution system losses. The AMI program will also allow the City to expand the use of real-time water demand data to support water budgets that are being implemented through its water efficient landscaping ordinance and conservation-oriented rates. Further, it will provide information to the City and its customers that is critical for implementing the City's municipal water shortage and drought management and response plan. By more efficiently managing uses of water, the City will also increase its efficiency in energy management.

For these reasons, we strongly support the City of Aspen's U.S. Bureau of Reclamation WaterSMART Water and Energy Efficiency Grant application for Meter Replacement in Support of Enhanced Water Loss Control.

If you have any further questions, please feel free to contact me at [marty@aspencore.org](mailto:marty@aspencore.org), or (970) 925-9775 x504.

Sincerely,

Marty Treadway  
Program Director, CORE

March 14, 2019

The Honorable Brenda Burman, Commissioner  
U.S. Bureau of Reclamation  
1849 C Street NW  
Washington, DC 20240-0001

Re: WaterSMART: Water and Energy Efficient Program  
City of Aspen Water Department Meter Replacement in Support of Enhanced Water Loss Control

Dear Commissioner Burman,

On behalf of WaterNow Alliance, I am pleased to write in support of the City of Aspen's WaterSmart Water and Energy Efficiency Grant application for Meter Replacement in Support of Enhanced Water Loss Control. WaterNow Alliance, a national network of local water leaders supporting sustainable water management measures, has been working with the City of Aspen's water department over the past year to support their water efficiency objectives.

The City of Aspen Water Department is a leader among Colorado utilities in implementing sustainable, resilient water solutions to address water supply reliability and water storage constraints. The City has adopted a variety of innovative water efficiency measures outlined in their 2015 Water Efficiency Plan (WEP), including an ambitious set of Water Efficient Landscaping Standards in 2018, designed to reduce outdoor water use by instituting water efficiency requirements and by requiring third party irrigation audits for new and retrofitted landscapes. Aspen is a community committed to implementing water use efficiency technology and in our view has both the internal expertise and capacity to implement and administer a WaterSmart Grant. This proposal would enable the City to continue to implement its laudable water conservation goals.

As part of its conservation effort, Aspen has decided to transition to an Advanced Metering Infrastructure ("AMI") system. The City has identified certain water meters within its service area that are incompatible with the AMI system. Replacing these meters to make the entire service area operable under the AMI system will support multiple projects identified in the 2015 WEP update and the City's ongoing water efficiency efforts. This technology will help the City with its enhanced water loss control program by identifying customer-side leaks and reducing water distribution system losses. The AMI program will also allow the City to expand the use of real-time water demand data to support water budgets that are being implemented through its water efficient landscaping ordinance and conservation-oriented rates. Further, it will provide information to the City and its customers that is critical for implementing the City's municipal water shortage and drought management and response plan. By more efficiently managing uses of water, the City will also increase its efficiency in energy management.

We believe that Aspen's proposal would advance the purposes of the WaterSMART Water and Energy Efficiency program and urge your favorable consideration of Aspen's grant application for the Meter Replacement project. Thank you for your consideration of our views.

Sincerely,



Cynthia Koehler, Executive Director  
WaterNow Alliance